

Notice of Allowability

Application No.

10/800,467

Examiner

Rene Garcia, Jr.

Applicant(s)

HASENBEIN ET AL.

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment Filed 5/15/07.
2. ☒ The allowed claim(s) is/are 1-15, 17-20, 22-28, 30-34 and 42-51.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


STEPHEN MEIER
SUPERVISORY PATENT EXAMINER


RENE GARCIA JR 07/07

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Christopher Bowley on 20 July 2007.

The application has been amended as follows:

In the claims:

Claim 43, delete "The method of claim 1" and insert "The method of claim 42"

Claim 44, delete "The method of claim 1" and insert "The method of claim 42"

Claim 45, delete "The method of claim 1" and insert "The method of claim 42"

Claim 46, delete "The method of claim 1" and insert "The method of claim 42"

Claim 47, delete "The method of claim 1" and insert "The method of claim 46"

Claim 48, delete "The method of claim 1" and insert "The method of claim 42"

Claim 49, delete "The method of claim 1" and insert "The method of claim 42"

Claim 50, delete "The method of claim 1" and insert "The method of claim 42"

Claim 51, delete "The method of claim 1" and insert "The method of claim 42"

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: The primary reason for the allowance of claims 1-15, 17 is the inclusion of the method steps for driving a droplet ejection device that includes applying a multipulse waveform comprising two or more drive

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pulses to cause ejection of a *single droplet of a fluid; wherein each pulse has an amplitude, the amplitude of each subsequent pulse in the two or more pulses is greater than the amplitude of earlier pulses; frequency of the drive pulses is greater than a natural frequency, f_j , of the droplet ejection device*. It is these steps found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 18-20, 22-27 is the inclusion of the method steps for driving a piezoelectric droplet ejection device that includes a waveform comprising two or more pulses each having a period less than about 25 microseconds to cause the droplet ejection device to *eject a single droplet in response to the pulses; each pulse having an amplitude, the amplitude of each subsequent pulse in the two or more pulses being greater than the amplitude of earlier pulses*. It is these steps found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 28, 30-33 is the inclusion of the limitations of an apparatus including droplet ejection device having a natural frequency f_j ; *wherein during operation the drive electronics drive the droplet ejection device with a multipulse waveform comprising a plurality of drive pulses having a frequency greater than f_j , and the harmonic content of the plurality of drive pulses at f_j is less than about 50% of the harmonic content of the plurality of the drive pulses at f_{max} , the frequency of maximum content..* It is these limitations found in each of the claims, as they are claimed in the combination, that has not been

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found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 42-51 is the inclusion of the method steps driving a droplet ejection device that includes applying a multipulse waveform comprising two or more drive pulses to eject a *single droplet of a fluid; wherein all the pulses increase the volume of the single droplet, and a frequency of the drive pulses is greater than a natural frequency, f_j , of the droplet ejection device.* It is these steps found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

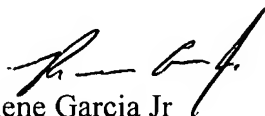
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


COMMUNICATION WITH THE USPTO

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rene Garcia, Jr. whose telephone number is (571) 272-5980. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Rene Garcia Jr
07/07


STEPHEN MEIER
SUPERVISORY PATENT EXAMINER